

SEQUENCE LISTING

<110> Cahoon, Edgar B.  
 Kinney, Anthony  
 Klein, Thodore  
 Lee, Jian Ming  
 Pearlstein, Richard  
 Rafalski, J. Antoni  
 Shen, Jennie  
 Thorpe, Cathy  
 Tingey, Scott  
 Weng, Zude

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 <151> 2000-02-09

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 gaagaagatc aaaggacgg tgggtcttat gagaagcaat gttttggact tcaccgaatt 180  
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 accagtgaat tcttcctcaa gtctgtaact ccnggaggat ttcttgccnt tggaaggtcc 480  
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 Arg Val Thr Asn Ile Gly Gly Lys Lys Ile Lys Gly Thr Val Val Leu  
 35 40 45  
 Met Arg Ser Asn Val Leu Asp Phe Thr Glu Phe His Ser Ser Leu Leu  
 50 55 60

Asp Gly Val Thr Glu Leu Leu Gly Gly Gly Ile Ser Leu Gln Leu Ile  
 65 70 75 80  
 Ser Ala Thr His Ala Ser Asn Asp Ser Arg Gly Lys Val Gly Lys Gly  
 85 90 95  
 Ala Phe Leu Glu Arg Trp Leu Thr Ser Val Pro Pro Leu Phe Ala Gly  
 100 105 110  
 Glu Ser Val Phe Gln Val Asn Phe Leu Gly Arg Glu Leu Trp Asp Phe  
 115 120 125  
 Gln Gly Ala Phe Phe Ile Lys Asn Gly His Thr Ser Glu Phe Phe Leu  
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 Lys Ser Val Thr Pro Gly Gly Phe Pro Gly Xaa Lys Val His Phe Asp  
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 Thr Tyr Ala Ser Arg Thr Leu Leu Ile Leu Arg Lys Asp Gly Thr Leu  
 35 40 45  
 Met Pro Leu Ala Ile Glu Leu Ser Leu Pro Asn Pro Arg Gly Asp Glu  
 50 55 60  
 Tyr Gly Ala Ile Cys Lys Val Tyr Thr Pro Ala Gln His Gly Val Glu  
 65 70 75 80  
 Ala Ser Leu Trp Gln Leu Ala Xaa Ala Tyr Val Val Val Asn Asp Ser  
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 Cys Ile His Glu Ser Val  
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 ggngacggcg tcggnggagg cgtcgccggc catcgggcag atgtacttcc agcgcgccgt 180  
 cgacgacatc ggcgacctcc tcggcaagac gctgctgctc gagctcgtca gctccgagct 240  
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 His Tyr Glu Ala Glu Phe Lys Val Pro Ala Ser Phe Gly Pro Val Gly  
 35 40 45  
 Ala Val Leu Val Glu Asn Glu His His Lys Glu Val Phe Ile Lys Glu  
 50 55 60  
 Ile Lys Leu Val Thr Gly Gly Asp Ser Ser Thr Ala Val Thr Phe Asp  
 65 70 75 80  
 Cys Asn Ser Trp Val His Ser Lys Phe Asp Asn Pro Glu Lys Arg Ile  
 85 90 95  
 Phe Phe Thr Leu Lys Ser Tyr Leu Pro Ser Asp Thr Pro Lys Gly Leu  
 100 105 110  
 Glu Asp Leu Arg Lys Lys Asp Leu Gln Ala Leu Arg Gly Asp Gly His  
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 Gly Glu Arg Lys Val Phe Glu Arg Val Tyr Asp Tyr Asp Val Tyr Asn  
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 Glu Leu Gly  
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 cacatcacat cggcaggcga gggacggagc gagcagggaa gcccatccac cagccagcca 180  
 ccgcgttcct gagaagcgaa gagcgagaaa aggcgaaana gcggncatgt tctggcacgg 240  
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 35 40 45  
 Gly Ala Ser Arg Glu Ala His Pro Pro Ala Ser His Arg Val Pro Glu  
 50 55 60  
 Lys Arg Arg Ala Arg Lys Gly Glu Xaa Ala Xaa Met Phe Trp His Gly  
 65 70 75 80  
 Val Ala Asp Arg Leu Thr Gly Lys Asn Lys Glu Ala Trp Ser Glu Gly  
 85 90 95  
 Lys Ile Arg Gly Thr Val Arg Leu Val Lys Lys Glu Val Leu Asp Val  
 100 105 110

Gly Asp Phe Asn Ala Ser Leu Leu Asp Gly Val His Arg Ile Leu Gly  
115 120 125

Trp Asp Asp Gly Val Ala Phe Ser Ser Ser Ala Pro Pro Arg Ala Thr  
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His Leu Lys Gly Asn Val Val Leu Val Arg Lys Thr Val Leu Gly Leu  
35 40 45

Asp Val Thr Ser Ile Ala Gly Ser Leu Leu Asp Gly Val Gly Glu Phe  
50 55 60

Leu Gly Arg Gly Val Thr Cys Gln Leu Ile Ser Ser Thr Val Val Asp  
65 70 75 80

Pro Asn Asn Gly Asn Arg Gly Lys Leu Gly Ala Glu Ala Ser Leu Glu  
85 90 95

Gln Trp Leu Leu Asn Pro Pro Pro Leu Leu Ser Ser Glu Asn Gln Phe  
100 105 110

Arg Val Thr Phe Asp Trp Glu Val Glu Lys Gln Gly Ile Pro Gly Ala  
115 120 125

Ile Ile Val Lys Asn Asn His Ala Xaa Glu Xaa Phe Leu Lys Thr Ile  
130 135 140

Thr Leu Asn Asp Val Pro Gly Thr Gly Pro Ser Ser Ser Ser Pro Thr  
145 150 155 160

His Gly Ser Thr Arg Ser Pro Ser Thr Ala Thr Thr Ala Ser Ser Ser  
165 170 175

Pro Thr Thr Arg Thr Phe Pro Ser Gln Met Pro Ala Ala Leu Lys Pro  
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Thr Xaa Thr Thr Ala Ser Gly Thr Xaa Thr Ile Val Phe Val Ala Asn  
195 200 205

Ser Trp Ile Tyr Pro Gln Ser Lys Tyr Arg Tyr Asn Arg Val Phe Phe  
210 215 220

Ser Asn Asp Thr Tyr Leu Pro Lys Pro Asp Ala Gly Gly Ala Glu Ala  
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 Arg Val Thr Asn Ile Gly Gly Lys Lys Ile Lys Gly Thr Val Val Leu  
 35 40 45

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Asp	Gly	Val	Thr	Glu	Leu	Leu	Gly	Gly	Gly	Ile	Ser	Leu	Gln	Leu	Ile	65	70	75
Ser	Ala	Thr	His	Ala	Ser	Asn	Asp	Ser	Arg	Gly	Lys	Val	Gly	Lys	Gly	85	90	95
Ala	Phe	Leu	Glu	Arg	Trp	Leu	Thr	Ser	Val	Pro	Pro	Leu	Phe	Ala	Gly	100	105	110
Glu	Ser	Val	Phe	Gln	Val	Asn	Phe	Asp	Trp	Glu	Glu	Asn	Phe	Gly	Phe	115	120	125
Pro	Gly	Ala	Phe	Phe	Ile	Lys	Asn	Gly	His	Thr	Ser	Glu	Phe	Phe	Leu	130	135	140
Lys	Ser	Val	Thr	Leu	Glu	Asp	Val	Pro	Gly	Phe	Gly	Arg	Val	His	Phe	145	150	155
Asp	Cys	Asn	Ser	Trp	Val	Tyr	Pro	Ser	Arg	Arg	Tyr	Lys	Lys	Asp	Arg	165	170	175
Ile	Phe	Phe	Ala	Asn	His	Thr	Cys	Leu	Pro	Ile	Asp	Thr	Pro	Asp	Ser	180	185	190
Leu	Arg	Lys	Tyr	Arg	Glu	Glu	Glu	Leu	Leu	Asn	Leu	Arg	Gly	Asp	Gly	195	200	205
Thr	Gly	Glu	Arg	Lys	Glu	Trp	Asp	Arg	Ile	Tyr	Asp	Tyr	Asp	Val	Tyr	210	215	220
Asn	Asp	Leu	Cys	Asp	Pro	Asn	Gly	Gly	Pro	Asn	Leu	Val	Arg	Pro	Ile	225	230	235
Leu	Gly	Gly	Ser	Asp	Gln	Tyr	Pro	Tyr	Pro	Arg	Arg	Gly	Arg	Thr	Gly	245	250	255
Arg	Pro	Pro	Ala	Arg	Lys	Asp	His	Lys	Tyr	Glu	Ser	Arg	Leu	Ser	Asp	260	265	270
Val	Met	Ser	Leu	Asn	Ile	Tyr	Val	Pro	Arg	Asp	Glu	Asn	Phe	Gly	His	275	280	285
Leu	Lys	Met	Ala	Asp	Phe	Leu	Gly	Asn	Thr	Leu	Lys	Val	Leu	Ser	Thr	290	295	300
Ser	Ile	Gln	Pro	Gly	Leu	Glu	Ser	Ile	Phe	Asp	Ser	Thr	Pro	Gly	Glu	305	310	315
Phe	Asp	Lys	Phe	Lys	Glu	Val	Asp	Asp	Leu	Phe	Glu	Arg	Gly	Phe	Pro	325	330	335
Ile	Pro	Leu	Asn	Ile	Phe	Lys	Asn	Leu	Thr	Glu	Asp	Leu	Ala	Pro	Pro	340	345	350
Leu	Phe	Lys	Ala	Phe	Leu	Arg	Ser	Asp	Gly	Glu	Arg	Phe	Leu	Lys	Tyr	355	360	365

Pro	Thr	Pro	Gln	Val	Ile	Lys	Asp	Asn	Lys	Leu	Gly	Trp	Arg	Thr	Asp
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Glu	Glu	Phe	Ala	Arg	Glu	Met	Ile	Ala	Gly	Val	Asn	Pro	Leu	Ile	Ile
385					390					395					400
Arg	Arg	Leu	Glu	Val	Phe	Pro	Pro	Leu	Ser	Lys	Leu	Asp	Pro	His	Val
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Tyr	Gly	Asn	Gln	Asn	Ser	Thr	Met	Thr	Glu	Glu	Gln	Ile	Lys	His	Gly
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Leu	Asp	Gly	Leu	Thr	Val	Asp	Glu	Ala	Ile	Lys	Glu	Asn	Lys	Leu	Tyr
		435					440					445			
Ile	Leu	Asp	His	His	Asp	Ala	Leu	Met	Pro	Tyr	Leu	Arg	Arg	Ile	Asn
450						455					460				
Ser	Thr	Ser	Thr	Lys	Thr	Tyr	Ala	Thr	Arg	Thr	Leu	Leu	Phe	Leu	Lys
465					470					475					480
Asp	Asp	Ser	Thr	Leu	Lys	Pro	Leu	Ala	Ile	Glu	Leu	Ser	Leu	Pro	His
				485					490					495	
Pro	Gln	Gly	Asp	Glu	His	Gly	Ala	Ile	Ser	Lys	Leu	Tyr	Phe	Pro	Ala
			500					505					510		
Glu	Gly	Arg	Val	Glu	Ser	Ala	Ile	Trp	Gln	Leu	Ala	Lys	Ala	Tyr	Val
		515					520					525			
Ala	Val	Asn	Asp	Ser	Gly	Tyr	His	Gln	Leu	Asn	Ser	His	Trp	Leu	His
530						535					540				
Thr	His	Ala	Val	Leu	Glu	Pro	Phe	Val	Ile	Thr	Thr	His	Arg	Arg	Leu
545					550					555					560
Ser	Val	Leu	His	Pro	Ile	His	Lys	Leu	Leu	Ala	Pro	His	Tyr	Lys	Asp
				565					570					575	
Thr	Met	Phe	Ile	Asn	Ala	Ser	Ala	Arg	Gln	Val	Leu	Ile	Asn	Ala	Gly
			580					585					590		
Gly	Leu	Ile	Glu	Ser	Thr	Gln	Phe	Pro	Ala	Lys	Tyr	Ala	Met	Glu	Leu
		595					600					605			
Ser	Ser	Tyr	Ile	Tyr	Lys	Glu	Trp	Lys	Phe	Pro	Asp	Glu	Ala	Leu	Pro
610						615					620				
Thr	Asn	Leu	Ile	Lys	Arg	Gly	Val	Ala	Ile	Glu	Asp	Ser	Gly	Ser	Pro
625					630					635					640
His	Gly	Val	Arg	Leu	Leu	Ile	Asn	Asp	Tyr	Pro	Phe	Ala	Val	Asp	Gly
				645					650					655	
Leu	Glu	Ile	Trp	Ser	Ala	Ile	Lys	Thr	Trp	Val	Thr	Asp	Tyr	Cys	Ser
			660					665					670		
Leu	Tyr	Tyr	Lys	Asp	Asp	Asp	Ala	Ile	Arg	Asn	Asp	Val	Glu	Leu	Gln
		675					680					685			

Ser Trp Trp Lys Glu Leu Arg Glu Lys Gly His Thr Asp Lys Lys Asp  
690 695 700

Glu Pro Trp Trp Pro Lys Met Gln Thr Phe Ser Glu Leu Ile Glu Ser  
705 710 715 720

Cys Thr Ile Ile Ile Trp Ile Ser Ser Ala Leu His Ala Ala Val Asn  
725 730 735

Phe Gly Gln Tyr Pro Tyr Gly Gly Tyr Val Pro Asn Arg Pro Thr Thr  
740 745 750

Ser Arg Arg Phe Met Pro Glu Val Gly Thr Ala Glu Tyr Lys Glu Val  
755 760 765

Glu Ser Asn Pro Glu Lys Ala Phe Leu Arg Thr Ile Ser Ser Gln Ile  
770 775 780

Val Ala Leu Leu Gly Leu Ser Ile Ile Glu Ile Leu Ser Lys His Ala  
785 790 795 800

Ser Asp Glu Val Tyr Leu Gly Gln Arg Ala Ser Ile Glu Trp Thr Ser  
805 810 815

Asp Lys Ser Ala Ile Glu Ala Phe Glu Lys Phe Gly Lys Glu Leu Phe  
820 825 830

Glu Val Glu Asp Arg Ile Met Arg Arg Asn Gln Asp Val Asn Leu Lys  
835 840 845

Asn Arg Ala Gly Pro Val Asn Met Pro Tyr Thr Leu Leu Val Pro Ser  
850 855 860

Ser Thr Glu Gly Leu Thr Gly Arg Gly Ile Pro Asn Ser Ile Ser Ile  
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<211> 1577  
<212> DNA  
<213> Impatiens balsamia

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tcttcttata cttaggaaaag atgggacttt gatgccatta gccattgagc taagcctgcc 180  
caacccaaga ggagatgaat atggtgccat atgcaaagtc tacaccccggt ctcaacatgg 240  
tgtagaagcc tccctttggc agcttgctaa agcctatgtc gtgggttaacg actctggtat 300  
ccacgaactc gtcagtcatt ggttgaacac gcatgcagtg attgagccat ttgtaatcgc 360  
gacaaacaga caactgagcg tacttcatcc gatacaaaaag ttgttgacc ctcattttcg 420  
agacacgatg aacattaatg caatcgcaag gaatgtacta atcaacgcgg gtggagttat 480  
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ggatgataaa gaaaaacgcg gtcttcgcat actcatagag gattaccggt atgctggtta 660  
cgggctagag atatggtttg cgataaaagac atgggtcgag gactattgct acttctacta 720  
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gaatttcggg caatacccat atggcggata ccattcctaac cggcccacaa atagccgaag 960  
gctaattgcc gaagtgggta gtcctgaatt cgaggagttg aagacaaatc cggaccaa 1020  
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ataattgtct ttattgtttg tattaataatg tatcccacta tgtaattata tacatatatta 1500
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<210> 14
<211> 445
<212> PRT
<213> Impatiens balsamia

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His His Asp Ser Leu Met Pro Tyr Leu Gly Arg Ile Asn Thr Thr Thr
          20          25          30
Thr Lys Thr Tyr Ala Ser Arg Thr Leu Leu Ile Leu Arg Lys Asp Gly
          35          40          45
Thr Leu Met Pro Leu Ala Ile Glu Leu Ser Leu Pro Asn Pro Arg Gly
          50          55          60
Asp Glu Tyr Gly Ala Ile Cys Lys Val Tyr Thr Pro Ala Gln His Gly
          65          70          75          80
Val Glu Ala Ser Leu Trp Gln Leu Ala Lys Ala Tyr Val Val Val Asn
          85          90          95
Asp Ser Gly Ile His Glu Leu Val Ser His Trp Leu Asn Thr His Ala
          100          105          110
Val Ile Glu Pro Phe Val Ile Ala Thr Asn Arg Gln Leu Ser Val Leu
          115          120          125
His Pro Ile Gln Lys Leu Leu His Pro His Phe Arg Asp Thr Met Asn
          130          135          140
Ile Asn Ala Ile Ala Arg Asn Val Leu Ile Asn Ala Gly Gly Val Ile
          145          150          155          160
Glu Asn Thr Phe Phe Thr Ser Lys Tyr Ser Met Glu Met Ser Ser Ala
          165          170          175
Ile Tyr Lys Asn Trp Ile Phe Thr Asp Gln Ser Leu Pro Val Asp Leu
          180          185          190
Ile Lys Arg Gly Ile Ala Val Lys Asp Asp Lys Glu Lys Arg Gly Leu
          195          200          205
Arg Leu Leu Ile Glu Asp Tyr Pro Tyr Ala Val Asp Gly Leu Glu Ile
          210          215          220
Trp Phe Ala Ile Lys Thr Trp Val Glu Asp Tyr Cys Asp Phe Tyr Tyr
          225          230          235          240

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Lys Gly Asp Glu Ala Val Lys Asn Asp Thr Glu Leu Gln Ala Trp Trp  
245 255

Lys Glu Leu Lys Glu Val Gly His Gly Asp Lys Arg Asn Glu Pro Trp  
260 270

Trp Pro Lys Met Glu Thr Arg Lys Asp Leu Leu Glu Thr Cys Thr Ile  
275 280 285

Ile Ile Trp Val Ala Ser Ala Leu His Ala Ala Leu Asn Phe Gly Gln  
290 295 300

Tyr Pro Tyr Gly Gly Tyr His Pro Asn Arg Pro Thr Asn Ser Arg Arg  
305 310 315 320

Leu Met Pro Glu Val Gly Ser Pro Glu Phe Glu Glu Leu Lys Thr Asn  
325 330 335

Pro Asp Gln Ile Leu Leu Lys Thr Leu Ser Ser Lys Ala Gln Thr Leu  
340 345 350

Leu Glu Val Ala Ile Ile Glu Ile Leu Ser Arg His Thr Ser Asp Glu  
355 360 365

Val Tyr Leu Gly Gln Arg Asp Thr Pro Glu Trp Thr Lys Asp Glu Glu  
370 375 380

Pro Leu Lys Ala Phe Asp Lys Phe Gly Lys Lys Leu Ala Glu Ile Glu  
385 390 395 400

Val Arg Ile Ile Glu Met Asn Asn Asp Glu Ser Leu Lys Asn Arg Asn  
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Gly Pro Val Lys Ile Pro Tyr Thr Leu Leu Phe Pro Thr Ser Ser Ser  
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Gly Leu Thr Gly Lys Gly Ile Ser Asn Ser Val Ser Ile  
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<210> 15  
<211> 3134  
<212> DNA  
<213> Zea mays

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ttattgccgg cacatcacat cggcaggcga gggacggagc gagcagggaa gcccatccac 180  
cagccagcca ccgcgttcct gagaagcgag gagcgagaaa agcgaagagc ggccatgttc 240  
tggcacgggg tcgcggaacc gctgacggga aagaacaagg aggcgtggag cgagggcaag 300  
atccgcggga cggtgaggct ggtcaagaag gagtgctg acgtcggcga cttcaacgcc 360  
tcgctcctcg acggcgctcca caggatcctc ggctgggacg acggcgctcg cttccagctc 420  
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 <211> 887  
 <212> PRT  
 <213> Zea mays

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 35 40 45  
 His Arg Ile Leu Gly Trp Asp Asp Gly Val Ala Phe Gln Leu Val Ser  
 50 55 60  
 Ala Thr Ala Ala Asp Pro Ser Asn Gly Gly Arg Gly Lys Val Gly Lys  
 65 70 75 80

Ala	Ala	His	Leu	Glu	Glu	Ala	Val	Val	Ser	Leu	Lys	Ser	Thr	Ala	Asp	
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Gly	Glu	Thr	Val	Tyr	Arg	Val	Ser	Phe	Glu	Trp	Asp	Glu	Ser	Gln	Gly	
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Ile	Pro	Gly	Ala	Val	Leu	Val	Arg	Asn	Leu	Gln	His	Ala	Glu	Phe	Phe	
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Leu	Lys	Thr	Leu	Thr	Leu	Glu	Gly	Val	Pro	Gly	Lys	Gly	Thr	Val	Val	
	130					135					140					
Phe	Val	Ala	Asn	Ser	Trp	Val	Tyr	Pro	His	Lys	Leu	Tyr	Ser	Gln	Glu	
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Arg	Ile	Phe	Phe	Ala	Asn	Asp	Thr	Tyr	Leu	Pro	Ser	Lys	Met	Pro	Ala	
				165					170					175		
Ala	Leu	Val	Pro	Tyr	Arg	Gln	Asp	Glu	Leu	Lys	Ile	Leu	Arg	Gly	Asp	
			180					185					190			
Asp	Asn	Pro	Gly	Pro	Tyr	Gln	Glu	His	Asp	Arg	Val	Tyr	Arg	Tyr	Asp	
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Tyr	Tyr	Asn	Asp	Leu	Gly	Asp	Pro	Asp	Lys	Gly	Glu	Glu	His	Ala	Arg	
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Pro	Ile	Leu	Gly	Gly	Ser	Gln	Glu	His	Pro	Tyr	Pro	Arg	Arg	Cys	Arg	
225					230					235					240	
Thr	Gly	Arg	His	Pro	Thr	Lys	Lys	Asp	Pro	Asn	Ser	Glu	Ser	Arg	Leu	
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His	Leu	Lys	Met	Ser	Asp	Phe	Leu	Gly	Tyr	Ser	Leu	Lys	Thr	Ile	Ile	
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Glu	Ala	Pro	Asn	Asn	Pro	Leu	Ile	Ala	Glu	Ile	Arg	Lys	Lys	Ile	Pro	
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Ser	Glu	Phe	Leu	Arg	Ser	Ile	Leu	Pro	Asn	Gly	Ser	His	Asp	His	Pro	
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Leu	Lys	Met	Pro	Leu	Pro	Asn	Val	Ile	Lys	Ser	Asp	Val	Leu	Lys	Lys	
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Ala	Pro	Glu	Phe	Lys	Phe	Gly	Trp	Arg	Thr	Asp	Glu	Glu	Phe	Ala	Arg	
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Glu	Thr	Leu	Ala	Gly	Val	Asn	Pro	Val	Ile	Ile	Lys	Arg	Leu	Thr	Glu	
385					390					395					400	

Phe Pro Ala Lys Ser Thr Leu Asp Pro Arg Gln Tyr Gly Asp His Thr  
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 Ser Lys Ile Thr Glu Ala His Ile Arg His Asn Met Gly Gly Leu Ser  
 420 425 430  
 Val Gln Asn Ala Leu Arg Asn Lys Arg Leu Phe Ile Leu Asp His His  
 435 440 445  
 Asp His Phe Met Pro Tyr Leu Asp Glu Ile Asn Glu Leu Glu Gly Asn  
 450 455 460  
 Phe Ile Tyr Ala Ser Arg Thr Leu Leu Phe Leu Lys Asp Asp Gly Thr  
 465 470 475 480  
 Leu Lys Pro Leu Ala Ile Glu Leu Ser Leu Pro His Pro Asp Gly Gln  
 485 490 495  
 Gln Arg Gly Ala Val Ser Lys Val Tyr Thr Pro Ala His Thr Gly Val  
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 Glu Gly His Val Trp Gln Leu Ala Lys Ala Tyr Ala Cys Val Asn Asp  
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 Ser Ala Trp His Gln Leu Ile Ser His Trp Leu Asn Thr His Ala Val  
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 Ile Glu Pro Phe Val Ile Ala Thr Asn Arg Gln Leu Ser Val Val His  
 545 550 555 560  
 Pro Val His Lys Leu Leu Ser Pro His Tyr Arg Asp Thr Leu Asn Ile  
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 580 585 590  
 Arg Thr Val Phe Pro Ala Lys Tyr Ala Leu Gly Met Ser Ala Asp Val  
 595 600 605  
 Tyr Lys Ser Trp Asn Phe Asn Glu Gln Ala Leu Pro Ala Asp Leu Val  
 610 615 620  
 Lys Arg Gly Val Ala Val Pro Asp Gln Ser Ser Pro Tyr Gly Val Arg  
 625 630 635 640  
 Leu Leu Ile Lys Asp Tyr Pro Tyr Ala Val Asp Gly Leu Val Ile Trp  
 645 650 655  
 Trp Ala Ile Glu Arg Trp Val Lys Glu Tyr Leu Asp Ile Tyr Tyr Pro  
 660 665 670  
 Asn Asp Gly Glu Leu Gln Arg Asp Val Glu Leu Gln Ala Trp Trp Lys  
 675 680 685  
 Glu Val Arg Glu Glu Ala His Gly Asp Leu Lys Asp Arg Asp Trp Trp  
 690 695 700  
 Pro Arg Met Asp Thr Val Gln Gln Leu Ala Arg Ala Cys Thr Thr Ile  
 705 710 715 720

Ile Trp Val Ala Ser Ala Leu His Ala Ala Val Asn Phe Gly Gln Tyr  
725 730 735

Pro Tyr Ala Gly Tyr Leu Pro Asn Arg Pro Thr Ala Ser Arg Arg Pro  
740 745 750

Met Pro Glu Pro Gly Ser His Asp Tyr Lys Lys Leu Gly Ala Gly Gln  
755 760 765

Lys Glu Ala Asp Met Val Phe Ile Arg Thr Ile Thr Ser Gln Phe Gln  
770 775 780

Thr Ile Leu Gly Ile Ser Leu Ile Glu Ile Leu Ser Lys His Ser Ser  
785 790 795 800

Asp Glu Val Tyr Leu Gly Gln Arg Asp Glu Pro Asp Arg Trp Thr Ser  
805 810 815

Asp Ala Lys Ala Leu Asp Ala Phe Lys Arg Phe Gly Ser Arg Leu Val  
820 825 830

Gln Ile Glu Asn Arg Ile Lys Thr Met Asn Asp Ser Pro Asp Leu Lys  
835 840 845

Asn Arg Lys Gly Pro Val Glu Met Pro Tyr Met Leu Leu Tyr Pro Asn  
850 855 860

Thr Ser Asp Val Thr Gly Glu Lys Ala Glu Gly Leu Thr Ala Met Gly  
865 870 875 880

Ile Pro Asn Ser Ile Ser Ile  
885

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<212> DNA  
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aggcgtcgcc ggccatcgcc cagatgtact tcagcgcgc cgtcgacgac atcggcgacc 180  
tcctcggcaa gacgtgctg ctcgagctcg tcagctccga gctcgacgca aagtccggcg 240  
tggaagaagac gcgggtgacg gcgtacgcgc acaagacgct gcgggagggc cactacgagg 300  
cggagttcaa ggtgccggcg tcgttcgggc cgggtgggcgc ggtgctggtg gagaacgagc 360  
accacaagga ggtcttcac aaggagatca agctcgtcac cggcggcgac agcagcaccg 420  
ccgtcacctt cgactgcaac tcctgggtgc actccaagtt cgacaaccg gagaagcgca 480  
tcttcttcac cctcaagtc aacctgccgt ccgacacgcc caaggggctg gaggacctga 540  
ggaagaagga cctgcaggcg ctgcgcggcg acgggcacgg cgagcgcaag gtgttcgagc 600  
gcgtctacga ctacgacgtg tacaacgacc tgggcgaccc ggacaagaac ccggcccacc 660  
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ccgggttcga cgccttcgc accgtcgtcc cgcgcattgt caagctggtg gaggacacca 1020  
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tgctgactga gttccccatc aagagcaagc tggacccgga ggtgtacggg ccagcggagt 1200  
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 cgctggcggc gaagcggctg ttcatacctg actaccacga cgtgttcctg ccctacgtgc 1320  
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 35 40 45  
 Lys Thr Leu Leu Leu Glu Leu Val Ser Ser Glu Leu Asp Ala Lys Ser  
 50 55 60  
 Gly Val Glu Lys Thr Arg Val Thr Ala Tyr Ala His Lys Thr Leu Arg  
 65 70 75 80  
 Glu Gly His Tyr Glu Ala Glu Phe Lys Val Pro Ala Ser Phe Gly Pro  
 85 90 95  
 Val Gly Ala Val Leu Val Glu Asn Glu His His Lys Glu Val Phe Ile  
 100 105 110  
 Lys Glu Ile Lys Leu Val Thr Gly Gly Asp Ser Ser Thr Ala Val Thr  
 115 120 125  
 Phe Asp Cys Asn Ser Trp Val His Ser Lys Phe Asp Asn Pro Glu Lys  
 130 135 140  
 Arg Ile Phe Phe Thr Leu Lys Ser Tyr Leu Pro Ser Asp Thr Pro Lys  
 145 150 155 160  
 Gly Leu Glu Asp Leu Arg Lys Lys Asp Leu Gln Ala Leu Arg Gly Asp  
 165 170 175  
 Gly His Gly Glu Arg Lys Val Phe Glu Arg Val Tyr Asp Tyr Asp Val  
 180 185 190  
 Tyr Asn Asp Leu Gly Asp Pro Asp Lys Asn Pro Ala His Gln Arg Pro  
 195 200 205  
 Val Leu Gly Gly Asn Lys Gln Tyr Pro Tyr Pro Arg Arg Cys Arg Thr  
 210 215 220  
 Gly Arg Pro Arg Thr Lys Lys Asp Pro Glu Thr Glu Met Arg Glu Gly  
 225 230 235 240  
 His Asn Tyr Val Pro Arg Asp Glu Gln Phe Ser Glu Val Lys Gln Leu  
 245 250 255

Thr Phe Gly Ala Thr Thr Leu Arg Ser Gly Leu His Ala Leu Leu Pro  
 260 265 270  
 Ala Leu Arg Pro Leu Leu Ile Asn Lys Lys Asp Leu Arg Phe Pro His  
 275 280 285  
 Phe Pro Ala Ile Asp Asp Leu Phe Ser Asp Gly Ile Pro Leu Pro Ala  
 290 295 300  
 Gln Thr Gly Phe Asp Ala Phe Arg Thr Val Val Pro Arg Met Val Lys  
 305 310 315 320  
 Leu Val Glu Asp Thr Thr Asp His Val Leu Arg Phe Glu Val Pro Glu  
 325 330 335  
 Met Ile Glu Arg Asp Arg Phe Ser Trp Phe Lys Asp Glu Glu Phe Ala  
 340 345 350  
 Arg Gln Thr Ile Ala Gly Leu Asn Pro Leu Cys Ile Gln Leu Leu Thr  
 355 360 365  
 Glu Phe Pro Ile Lys Ser Lys Leu Asp Pro Glu Val Tyr Gly Pro Ala  
 370 375 380  
 Glu Ser Ala Ile Thr Lys Glu Ile Leu Glu Lys Gln Met Asn Gly Ala  
 385 390 395 400  
 Leu Thr Val Glu Gln Ala Leu Ala Ala Lys Arg Leu Phe Ile Leu Asp  
 405 410 415  
 Tyr His Asp Val Phe Leu Pro Tyr Val His Lys Val Arg Glu Leu Gln  
 420 425 430  
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Val Xaa Glu Pro Phe Val Ile Xaa Thr Xaa Arg Xaa Leu Ser Val Xaa  
                   20                  25                  30

His Pro Xaa Xaa Lys Leu Leu Xaa Pro His Xaa Xaa Asp Thr Xaa Xaa  
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Ile Asn  
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 Tyr Pro Tyr Xaa Gly Xaa Xaa Xaa Asn Arg Pro Xaa Xaa Ser Arg Arg  
 20 25 30

<210> 21  
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<400> 21  
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